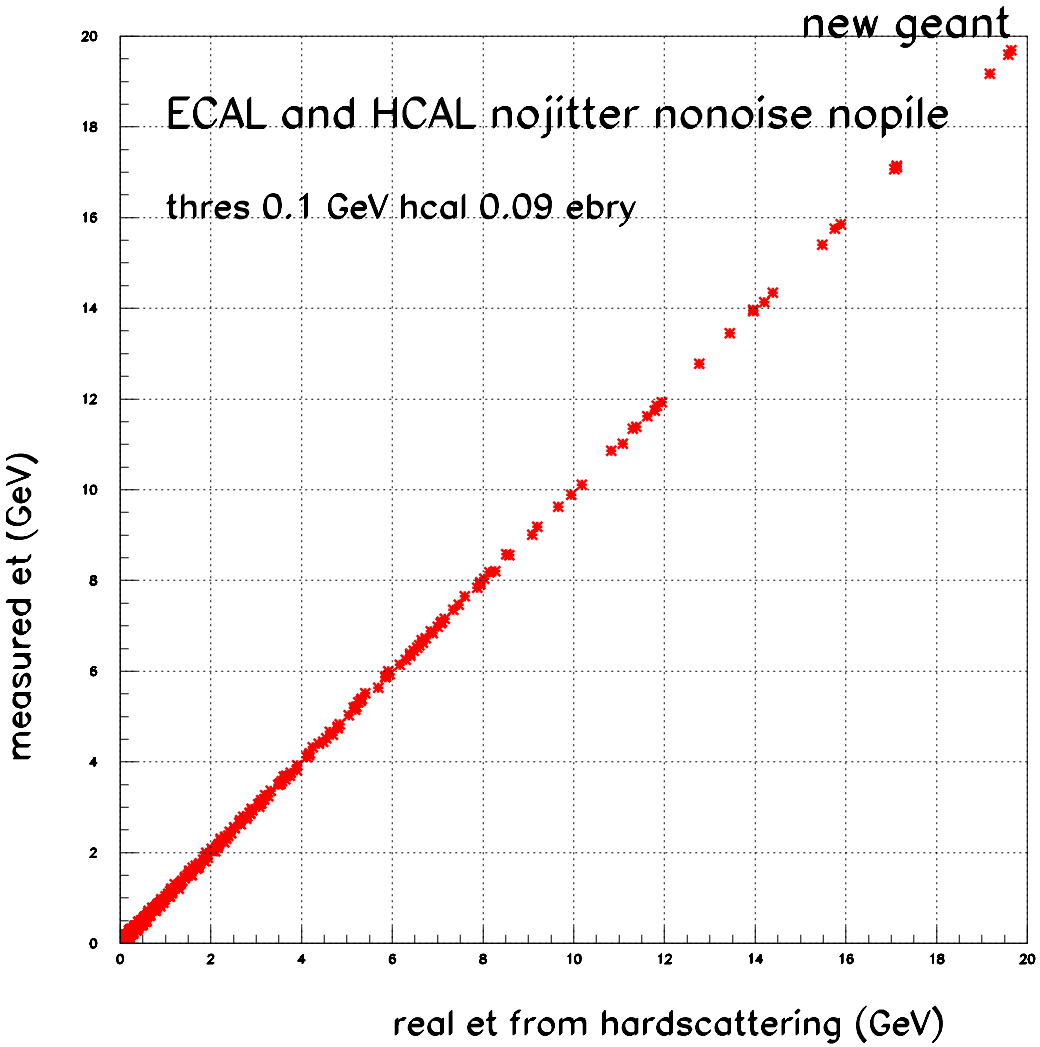
Affect of Jitter on Hcal?

Jitter = energy might not be deposited at the time you think it will (=distance from interaction point/ c). Especially, some energy may be deposited (much?) latter (from slow neutrons, etc).

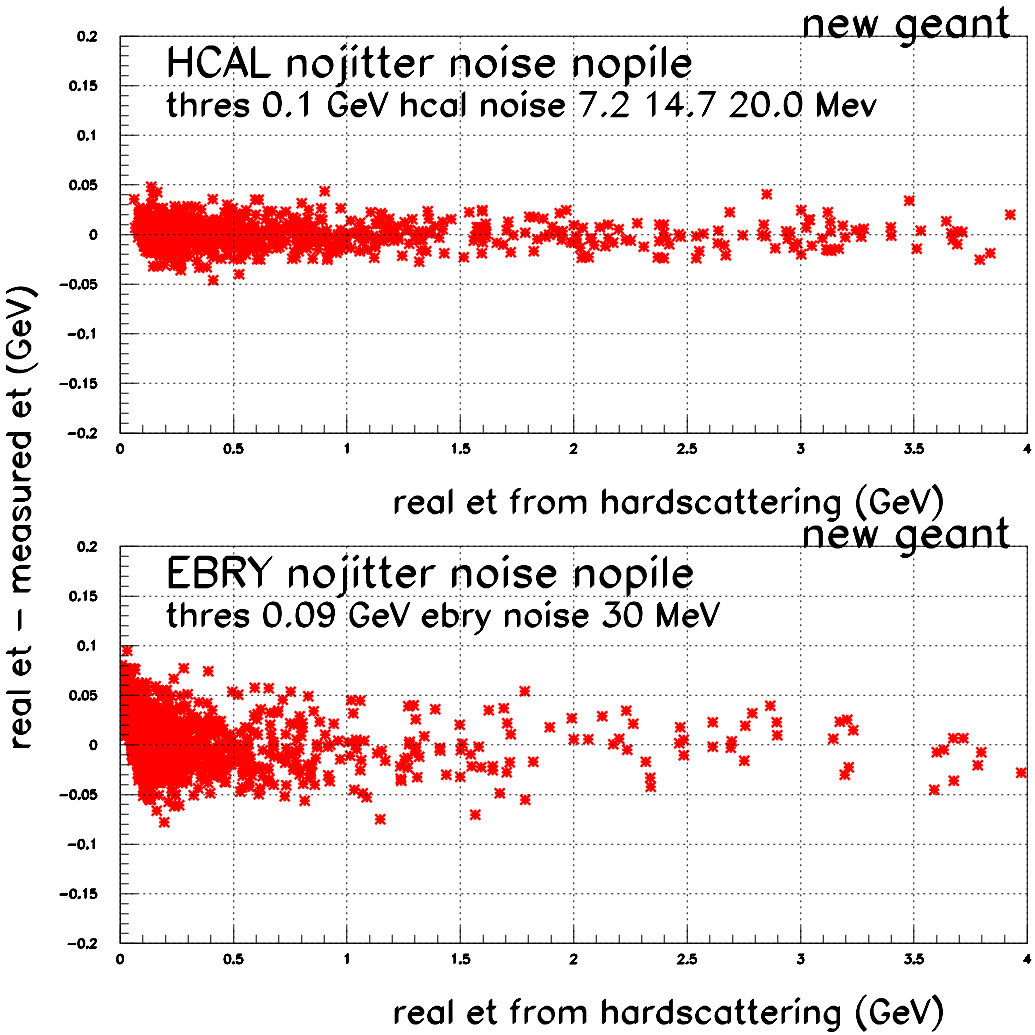
first test: 30 GeV pions at eta =0.4, phi=90 degrees (100 events)

No noise, no jitter



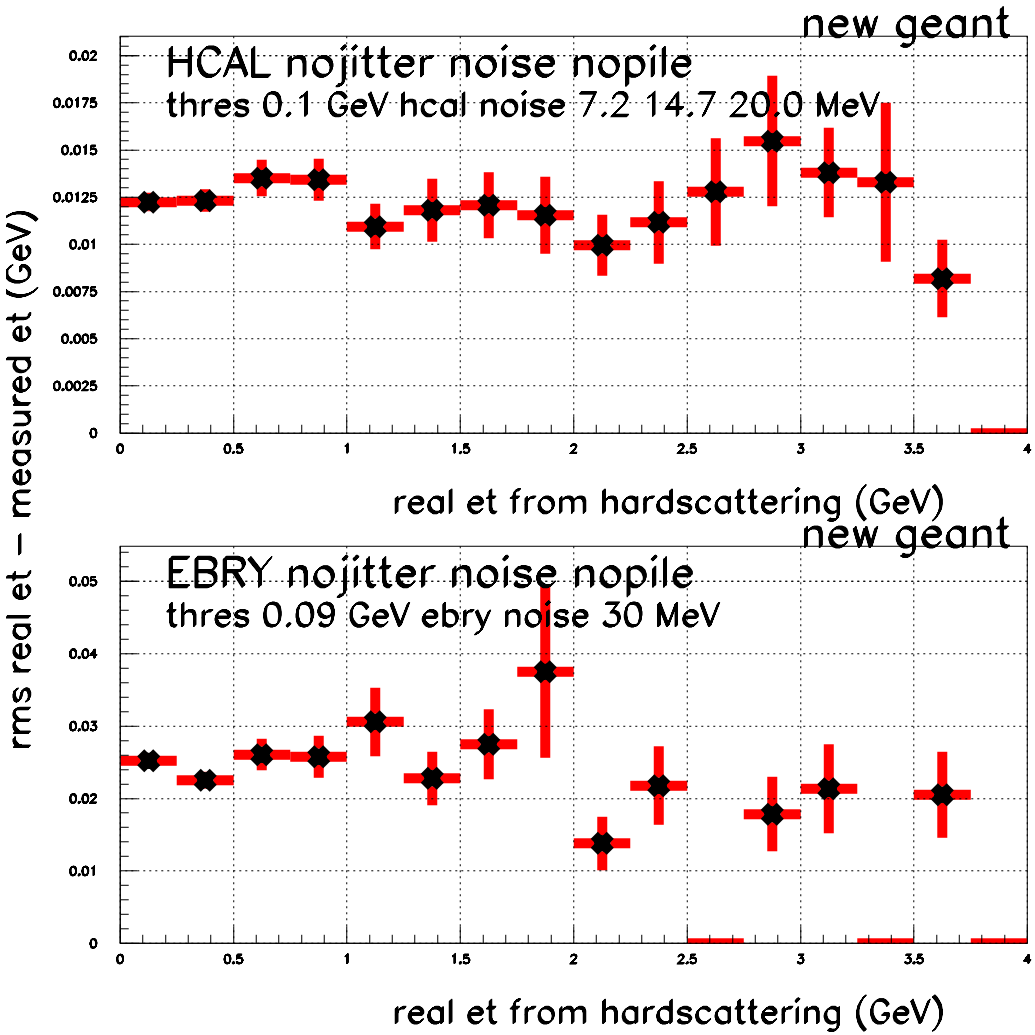
When there is no noise and no jitter, the energy that comes out of the complex digization simulation equals the GEANT energy (geant “hit”)

noise



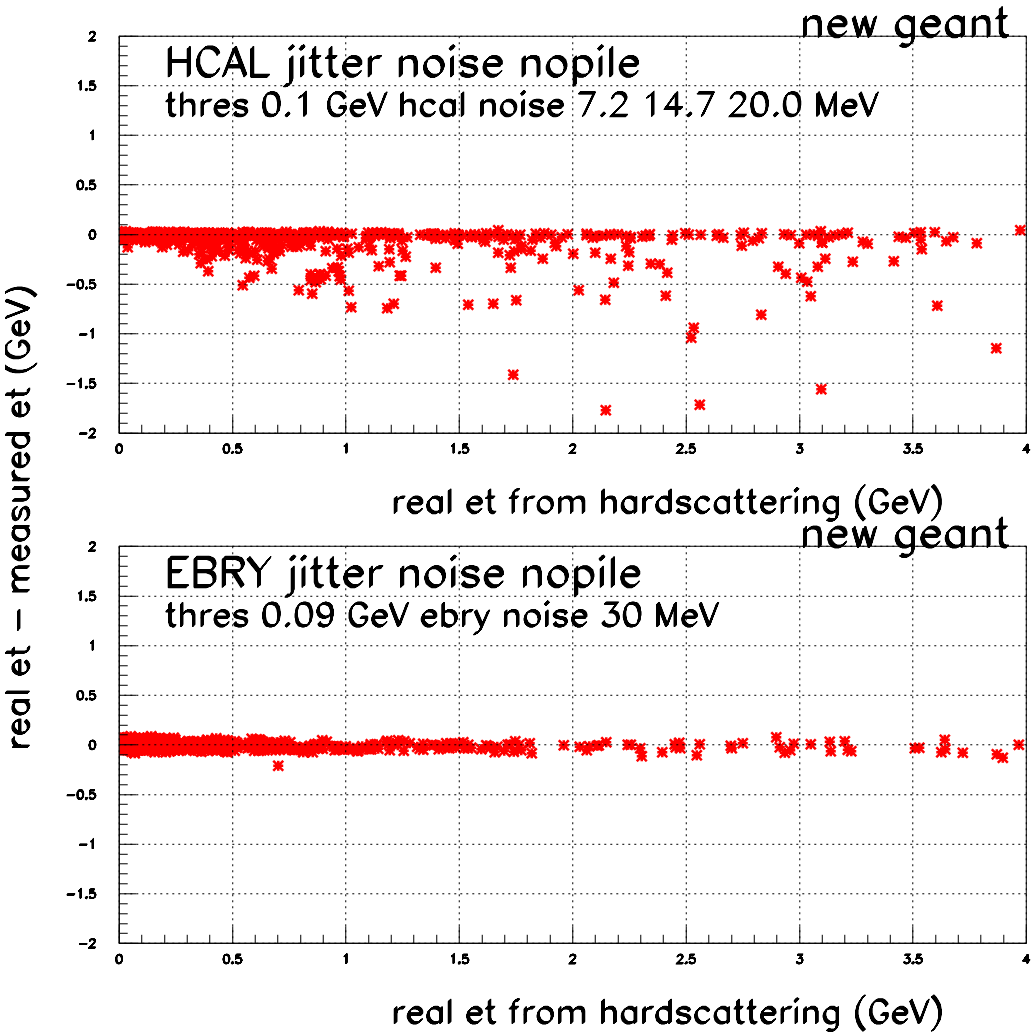
Noise is added in ORCA during the digitization simulation. Gives scatter between ORCA ("measured") energy and GEANT ("real") energy

noise



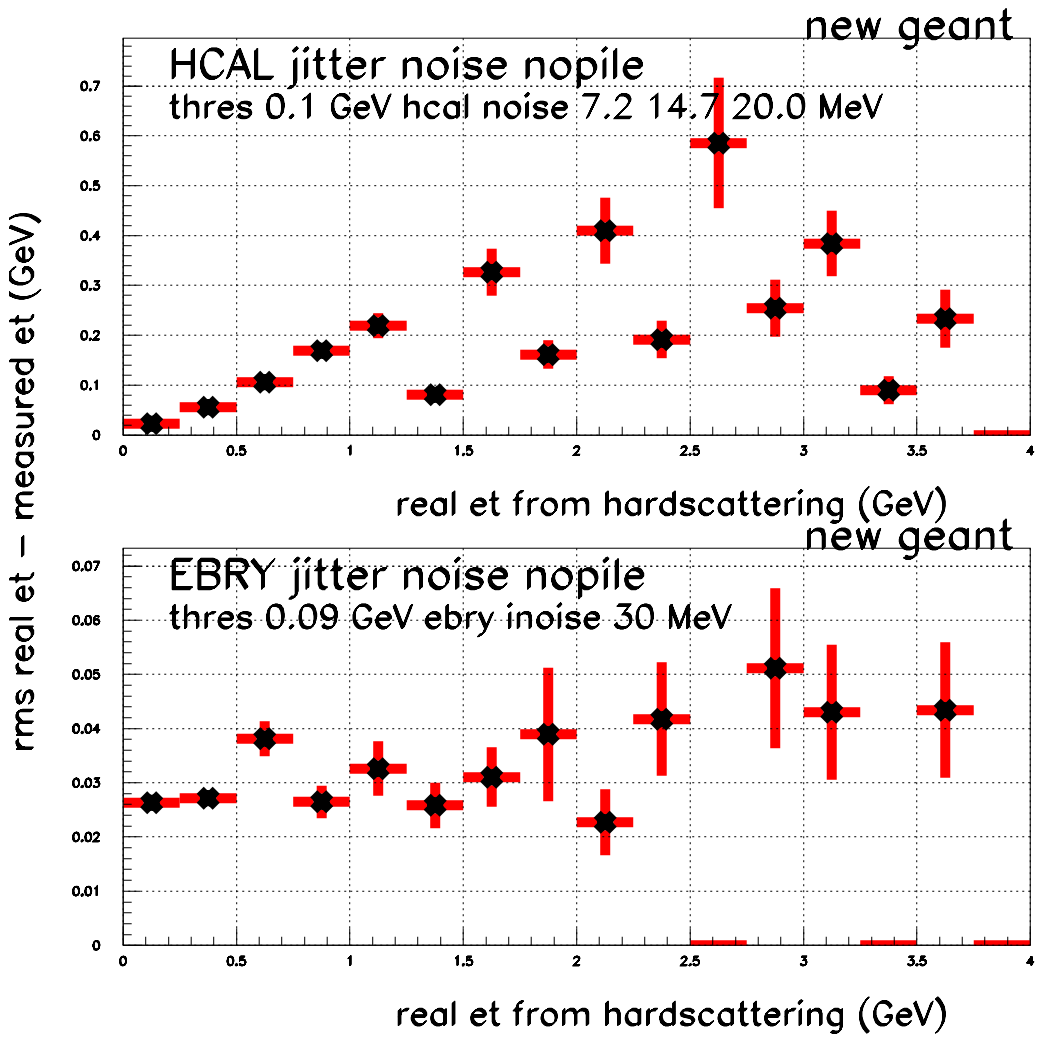
Plot rms of measured-real and recover size of injected noise (plots are a little ratty due to lack of stats)

Jitter

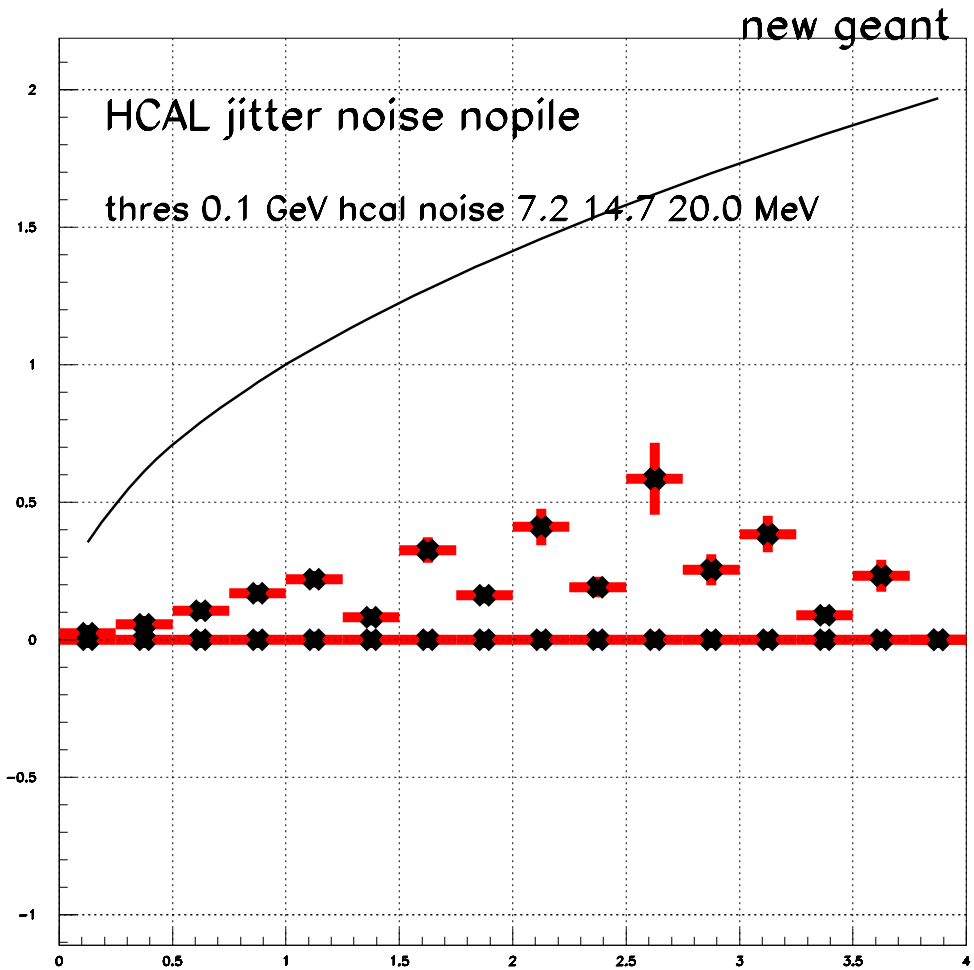


Turn on jitter. Signficant affect in hcal. Not much affect in ecal.

jitter


new geant
HCAL jitter noise nopile
thres 0.1 GeV hcal noise 7.2 14.7 20.0 MeV
rms real et – measured et (GeV)
real et from hardscattering (GeV)
new geant
EBRY jitter noise nopile
thres 0.09 GeV ebry inoise 30 MeV
rms real et – measured et (GeV)
real et from hardscattering (GeV)

Scale of jitter



Still, affect of jitter is much smaller than intrinsic hcal resolution (solid curve) so doesn't affect hcal resolution much.